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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,342	03/01/2004	Aamod Khandekar	030372	2417

23696 7590 07/27/2007  
QUALCOMM INCORPORATED  
5775 MOREHOUSE DR.  
SAN DIEGO, CA 92121

EXAMINER
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KIM, KEVIN

ART UNIT	PAPER NUMBER
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2611

NOTIFICATION DATE	DELIVERY MODE
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07/27/2007

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

us-docketing@qualcomm.com  
kascanla@qualcomm.com  
nanm@qualcomm.com

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<b>Office Action Summary</b>	<b>Application No.</b> 10/791,342	<b>Applicant(s)</b> KHANDEKAR ET AL.	
	<b>Examiner</b> Kevin Y. Kim	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 5-10-2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 and 45-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9, 10, 12-25, 29-33, 35, 38-41, 45, 47, 48, 52 and 53 is/are rejected.
- 7) ☒ Claim(s) 5-8, 11, 26-28, 34, 36, 37, 46 and 49-51 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The indicated allowability of the claims in the previous Office action is withdrawn in view of the newly discovered reference(s) to US 2003/0031278. Rejections based on the newly cited reference(s) follow.

### ***Claim Objections***

2. Claim 6,7 are objected to because of the following informalities: Claim 6 is written as dependent on claim 1 but is understood as dependent on claim 5 since it further defined the subject matter of claim 5. Likewise, claim 7 is understood as dependent on claim 6. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4,9,10,12-25,29-32,35,38-41,49,45,48,52,53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al (US 2003/0031278).

Claims 1, 10,16,20,22,24,29,30,31,35,38,40,45,52,53.

Kang et al discloses a method and receiver of recovering data in a wireless communication system, comprising:

obtaining prior information for channel gain based on pilot symbols (see paragraph [0046]);

deriving forward information for code bits corresponding to received data symbols based on the received data symbols and the prior information for channel gain and interference (see paragraph [0047]);

decoding the forward information to obtain feedback information for the code bits corresponding to the received data symbols (see paragraph [0049]);

deriving a posteriori information for channel gain for each of the received data symbols based on the feedback information for the code bits corresponding to the received data symbol (see paragraph [0052]); and

combining the a posteriori information for channel gain and interference for the received data symbols and the prior information for channel gain to obtain updated information for channel gain and interference for each of the received data symbols (see paragraph [0054]).

Claims 2,3,17,21,23,25,32,39,41,47.

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The feedback structure illustrated in Fig.5 shows that the forward information is derived iteratively and/or repeatedly based on the updated information for channel gain and interference. So is decoding the forward information, deriving a posteriori information and combining.

Claims 4 and 33.

See paragraph [0047] for LLR representation of the forward and feedback information.

Claim 9.

Since the gain is updated continuously, the updated information is obtained by the combining the prior information and the posteriori information for other ones of the received data symbols.

Claims 12-15.

Kang et al discloses a receiver in a wireless communication system, comprising:

a detector (513,515,517) operative to obtain prior information for channel gain and interference and derive forward information for code bits corresponding to received data symbols; and

a decoder (519) operative to decode the forward information and provide feedback information for the code bits corresponding to the received data symbols, and wherein the detector is further operative to derive updated information for channel gain and interference using the feedback information, and wherein the detector and the decoder are operative to exchange forward and feedback information for a plurality of iterations.

See paragraphs [0046] - [0058] in particular for the limitations of claims 13-15.

Claim 18.

Kang et al teach a OFDM communication system. See Abstract.

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Claim 19.

Frequency hopping is a well known communication method and thus would have been obvious to one skilled in the art at the time the invention was made to increase channel efficiency and data protection among other benefits of the spread communication method.

Claim 48.

See paragraph [0039] for PSK modulation.

***Allowable Subject Matter***

6. Claims 5-8, 11,26-28,34,36,37,46,49-51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

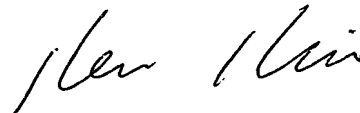
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 23, 2007

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KEVIN KIM  
PRIMARY PATENT EXAMINER

A handwritten signature in cursive script, appearing to read "Kevin Kim", is written below the printed name and title.